

Tailed Emperor

(*Charaxes sempronius sempronius*)

METAMORPHOSIS AUSTRALIA

Magazine of the Butterfly & Other Invertebrates Club

ISSUE NO: 95

DATE: DECEMBER 2019

Price \$6.00

ISSN: 1839-9819

<http://www.boic.org.au>

PLANNING AND ORGANIZING COMMITTEE 2019

President:	Ross Kendall	07 3378 1187
Vice President:	Richard Zietek	07 3390 1950
Treasurer:	Rob MacSloy	07 3824 4348
Secretary:	Dawn Franzmann (secretaryboic@gmail.com)	07 3325 3573
Magazine:	Daphne Bowden (daphne.bowden1@bigpond.com)	07 3396 6334
Committees Members:	John Moss	07 3245 2997
	David Exton	0419 431 210

PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.
See BOIC Programme.

CONTACT ADDRESS AND MEMBERSHIP DETAILS

PO Box 2113, Runcorn, Queensland 4113

Membership fees are \$30 for individuals, schools, and organizations.

AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1st June issue – May 1st

September issue – August 1st December issue – November 1st

All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

**ALL MATERIAL IN THIS MAGAZINE IS COPYRIGHT TO THE AUTHORS, ARTISTS,
PHOTOGRAPHERS, AND THE BOIC.**

COVER PHOTO

Tailed Emperor (*Charaxes sempronius sempronius*) – Painting by Peter Hendry



FROM THE PRESIDENT

I did not intend to be prophetic about “hanging up the cue” when I wrote for our magazine in June but such thoughts did occur in September when I was forced to pay for the earlier sins of abuse of my spine and underwent surgery to repair the damage. This is best described as “character building”. However, no one is indispensable, and the affairs of the club have progressed smoothly during this challenging period of incapacity and recovery.

I know this sounds repetitive, but the successes of our club come from the dedication of many members. Thank you all.

You will read elsewhere of the club’s activities at the Native Plants Queensland annual Spring Flower Show in early September. The sale of butterfly host plants was a huge success with a much larger number of plants made available and all sold. We must thank Dennis Bell, Dale Borgelt, Daphne Bowden, Judy Burgess, Bernie Franzmann, Morag McKinnon, Garry Sankowsky, Maurie Tucker, Richard Zietek and the Lovelock family for donating plants. Daphne has seeds in the seed bank and I encourage you to obtain some, germinate them, plant more host plants in your garden/area and also donate some to the cause next year.

We are grateful to the many that have sent articles to once again make this an interesting and enjoyable read.

Best wishes Ross

IN THIS ISSUE

The genus <i>Charaxes</i> (Lepidoptera: Nymphalidae) a look at the Australian species.....	4
Life history notes on the Large Yellow Grass-dart, <i>Taractrocera anisomorpha</i>	19
Rearing Caterpillars.....	23
Extract from The Mistletoes of Sub-tropical Queensland etc.....	26
Book Reviews - Caterpillars, moths, and their plants of Southern Australia.....	28
Butterflies of the World.....	29
One small place on earth.....	30
You asked.....	31
Reports - Panel of Experts – Downfall Creek Bushland Centre.....	31
Native Plants Queensland (NPQ) Flower Show	32
Deagon Wetlands Excursion.....	33
Seed Bank.....	35
BOIC Programme	35



The genus *Charaxes* (Lepidoptera: Nymphalidae) a look at the Australian species from an historical perspective and an overall view of the world taxa –**Peter Hendry**

The genus *Charaxes* was raised by German born actor and entomologist Ferdinand Ochsenheimer in 1816. The type species was described as *Papilio jasius* Linnaeus, 1767 (now *Charaxes jasius*) from Barbaria (Algeria). *C. jasius* also occurs in the Mediterranean region making it the only European species of the genus. The *Charaxes* have their highest diversity in Africa and are also found throughout southern Asia and the Indo-Pacific including Australia. The *Charaxes* belong to the butterfly family Nymphalidae Rafinesque, 1815 known as brush-footed butterflies, most species have a reduced pair of forelegs which they curl up while only standing on four legs. The current numbers of Nymphalidae taxa (27-01-2019), from www.nymphalidae.net are as follows: 12 subfamilies, 45 tribes, 541 genera and 6273 species. The *Charaxes* are contained within the subfamily Charaxinae Guenée, 1865 and are the sole members of the tribe Charaxini Guenée, 1865. There are 254 species, 110 of which have subspecies, totalling 684 taxa including subspecies. This article follows the work of, Aduse-Poku, Vingerhoedt & Wahlberg, 2009 who synonymize *Polyura* and *Euxanthe* with *Charaxes* and subdivided them into five subgenera, being, *Nichetes*, *Polyura*, *Eriboea*, *Euxanthe* and *Charaxes*. Because of the numbers involved, the *Charaxes* are further subdivided into species groups, an informal phenetic¹ arrangement. Based on the works of Aduse-Poku et al, 2009, Müller, Wahlberg, and Beheregaray, 2010 and Toussaint, E. F. A., Morinière J., Müller C. J., Kunte K., Turlin B., Hausmann A. and Balke M., 2015, there are currently 33 such species groups.

For the purposes of this article I have relied heavily on the *Charaxes* checklist, provided by Professor Niklas Wahlberg on the Nymphalidae.net website (accessed 20/07/2019) for all my statistics. However, I have used Braby, 2010 for the subspecies *Charaxes sempronius tiberius* (Waterhouse, 1920) from Lord Howe Island, in Wahlberg's checklist as *Charaxes pyrrhus tiberius*. I have noted throughout the text other differences, which may or may not be correct, but these were not included in any statistics given. I found Wahlberg's checklist to be the most complete and up to date.

In general the *Charaxes* have a fast and robust flight, do not fly low except when feeding and often settle high up on treetops with its wings folded. They tend not to visit flowers but feed readily on tree saps, rotten fruits and animal dung and seldom mud puddle. Most males show hill-topping behaviour.



Fabricius 1794

Sempronius

LXVI

Drury



Alio bicaudato albo marginato albo punctato. —

Fig. 1: *Charaxes sempronius sempronius* Fabricius, 1793 from Jones's Icons.
Reproduced here under permission of the Oxford University Museum of Natural History



The Australian Taxa:

Subgenus *Polyura*, *Pyrrhus* group: Two species and one subspecies apply to Australia.

Charaxes sempronius sempronius Fabricius, 1793; The Tailed Emperor, *Charaxes sempronius sempronius*, was originally named by the Danish zoologist Johan Christian Fabricius, under his *Nymphalis*, as *Papilio sempronius* in *Entomologia Systematica Emendata et Aucta III* in 1793. During the process he consulted a watercolour by William Jones, painted from a specimen in Dru Drury's collection. The location from which the specimen was collected was not noted. Fabricius described over two hundred new species of Lepidoptera with the support of Jones's paintings which were never published. Of these, where the original type specimens have been lost the paintings are known as Iconotypes. Known as the six-volume "Jones Icons" 1783-1785, Salmon, 2000, they are available for viewing on line at the Oxford University Museum of Natural History website www.oum.ox.ac.uk/collections/record.php?irn=1961. *P. sempronius* can be found under Papiliones (WJ/B/1/4), Plate LXVI; reproduced here (Fig.1) under permission of the Oxford University Museum of Natural History, who hold the copyright.

Godart, 1824 referred to *C. s. sempronius* as *Nymphalis sempronius*, this was followed by Westwood, [1850] in *The Genera of Diurnal Lepidoptera* Volume 2, even though Doubleday, 1844, who authored volume 1 and was instrumental in both volumes, had placed it in *Charaxes* (see below). Kirby, 1871 also referred to the taxon as *Nymphalis sempronius*.

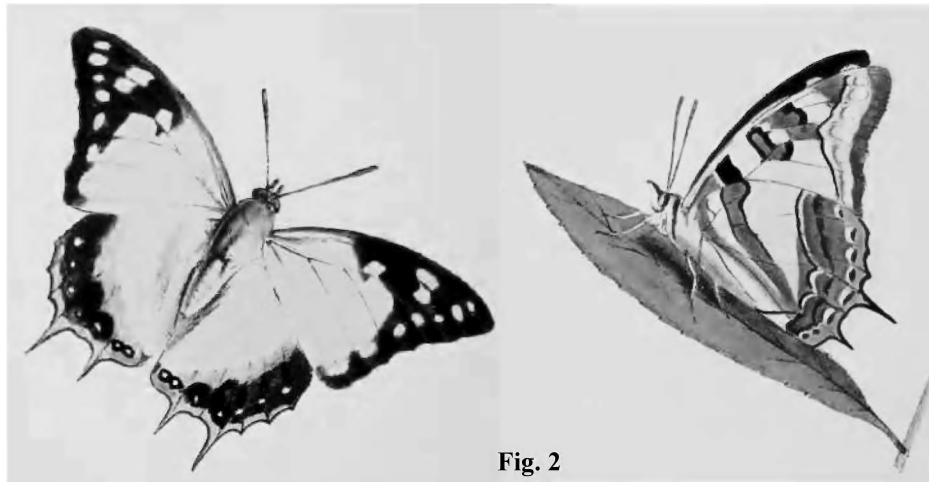


Fig. 2



The first synonym was published by Swainson, 1833 under the name *Jasia australis* (Fig. 2). This also seems to be the first record of *C. s. sempronius* being from Australia. In his description Swainson unknowingly states, “*We believe the specimen from which our figures of this new and strikingly distinct butterfly were taken, is the only one which has yet been sent to Europe. It was captured by Mr. Cunningham* (Allan Cunningham the explorer), who accompanied Captain King, in his voyage to the North West coast of Australia, on the skirts of Careening Bay, Port Nelson, where the Ship Mermaid was hove down; and the officers had more leisure [sic] to attend to zoological pursuits”. Swainson, also noted, “*Mr. Cunningham remarked that it flew with great swiftness*”.

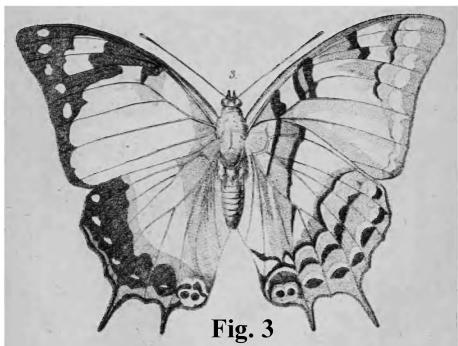


Fig. 3

Doubleday, 1844, under the genus *Charaxes*, listed the locations of capture and donor, of the three specimens then in the British Museum, as follows: “(a) *South Creek, Australia. Presented by J. Hunter, Esq.* (b) *Australia from Mr Childern's collection.* (c) *Australia. Presented by Dr. A. Sinclair, R.N.*”. Amongst others the name *Charaxes sempronius* was also used by the following Butler, 1866 & 1896; Edwards, 1889; Illidge, 1898; Beutenmüller, 1901;

Rainbow, 1907 and Froggatt, 1907. Another early use of the genus *Charaxes* for this taxon was by Felder & Felder, 1859 when they described a second synonym as *Charaxes tyrtaeus* (Fig. 3). Interestingly Felder & Felder compared their specimen to a species that Linnaeus, 1758, had described as *Papilio pyrrhus*, pointing out several differences.

Rothschild & Jordan, 1898, placed *sempronius* in the genus *Eulepis* as a subspecies of Linnaeus's *pyrrhus*, (*Eulepis pyrrhus sempronius*). This arrangement was followed by Waterhouse & Lyell, 1914, in their monumental volume, Butterflies of Australia. The genus *Eulepis* was raised by Billberg, 1820, placing within it, one species *athamas* which turned out to be a manuscript name making the genus *Eulepis* a *nomen nudum*². Scudder, 1875, mistakenly stated as *athamas* was the sole species of *Eulepis* it was therefore the type; believing it referred to Drury's *Papilio athamas*. Moore, 1881, followed suit. A note by Röber, 1909, within Seitz's *Die Groß-Schmetterlinge der Erde* 1, p169, points out these errors. Röber nominated *Eriboea*, Hübner, 1819, as a replacement name, mistakenly believing “*that Papilio athamas Drury was the type species for that genus*”, Hemming, 1967. This was first pointed out by Hemming in 1934 in *The Generic Names of the Holarctic Butterflies*, a work I do not have access to.



The Tailed Emperor was referred to as *Eriboea Pyrrhus sempronius* by several Australian authors including, Waterhouse, 1932; Barrett, & Burns, 1951 and Miskin, 1960. The true type species for *Eriboea* is *Papilio ethocles* Cramer, 1777, by subsequent designation by Scudder, 1875, however it was found that *Papilio ethocles* was referred to the *Charaxes* making *Eriboea* a junior subjective synonym³ of *Charaxes* (*Eriboea* is now referred to as a subgenus of *Charaxes*; e.g. Williams, 2018). *Polyura*, Billberg, 1920, with the type species *pyrrhus*, replaced *Eriboea* and *Polyura pyrrhus sempronius* was being used for the Tailed Emperor from around 1939 on. There are many examples of the use of *Polyura pyrrhus sempronius*, Stichel, 1939; Harslett, 1965; McCubbin, 1971; D'Abreia, 1971 & 1977; Common & Waterhouse, 1972; Quick, 1974; Atkins, 1975; Smart, 1976; Hatch, 1977; Brunet, 1977; Daniels & Moulds, 1977; Fisher, 1978 & 1995; De Baar, 1979; Braby, 1987 and Faithfull, 1992.

As early as 1920 Mr. G. Talbot, under the genus *Eriboea* viewed *sempronius* as a species in its own right and referred to the Australian species as *Eriboea sempronius sempronius*. This was largely ignored until Smiles, 1982, now working under the genus *Polyura* reinstated *Polyura sempronius sempronius*. The name *Polyura sempronius sempronius* has been used by, Dunn & Aston, 1985; Braby, 2000 and simply as *Polyura sempronius* by Braby, 2004, Orr & Kitching, 2010 and others. Aduse-Poku et al, 2009 synonymize *Polyura* with *Charaxes* and recommended that it be treated as a subgenus of *Charaxes*. Braby, 2010 formalized the Australian taxon into *Charaxes*. The name *Charaxes sempronius sempronius* or simply *Charaxes sempronius*, has been used by Braby, 2011 & 2016 and by Field, 2013.

While *Charaxes* seems widely accepted, a recent paper by Müller & Tennent, 2018, is titled ‘*Polyura inopinatus* Röber, 1940; a remarkable butterfly mystery resolved’ in which they state “*The butterfly (inopinatus) was described by Röber in the genus Charaxes but note that we continue to use Polyura in the sense of Smiles (1982) for the group of Indo-Australian Charaxini with an open hindwing discal cell*”. Smiles, 1982, stated “*All species of Charaxes have the hindwing cell closed by a non-tubular vein, and although this vein is small it is always present. Polyura species have the hindwing cell completely open, and I consider this character state to be apomorphic*”⁴, and went on to note 38 differing characters to construct his cladogram⁵. This “open cell” of the hindwing has been the main character used to separate *Polyura* from *Charaxes* by most authors. Aduse-Poku et al, 2009 stated, “*Perhaps the only important morphological difference between these two closely related taxa is the venation of the hindwing cell, which is open in Polyura, but is closed in all Charaxes (Smiles, 1982). Aside from this trivial difference (known to vary considerably in Nymphalidae, e.g. Freitas and Brown, 2004), they share almost all the important synapomorphic*⁶ *characters used to define Charaxes (Smiles, 1982)*”. Toussaint et al, 2015 also continued to use *Polyura*, describing two new species as *Polyura paulettae*



and *Polyura smilesi* and again Toussaint, Morinière, and Blake, 2016 used *Polyura* as a genus. In a more recent paper however, Toussaint, Turlin and Blake, 2019 the new species *paulettae* was referred to as *C. (Polyura) paulettae*.

Charaxes sempronius tiberius Waterhouse, 1920 in 1889 in the *Memoirs of the Australian Museum*. No. 2 a paper titled Lord Howe Island : its Zoology, Geology, and Physical Characters was published. Sidney Olliff wrote a section in this publication titled The Insect Fauna of Lord Howe Island in which he noted the presents of *Charaxes sempronius*.

In 1920 in a paper titled, Descriptions of new forms of butterflies from the South Pacific. *Proceedings of the Linnean Society of New South Wales* 45(3): 468-471, Gustavus Athol Waterhouse described a new subspecies under the name *Eulepis pyrrhus tiberius* (now *Charaxes sempronius tiberius*) from a female collected on Lord Howe Island in February 1915. In his description he noted “*When I received this specimen, I at once recognised that a distinct race inhabited the island, being much paler above and the markings beneath being obscure. Its chief difference is the great reduction of the dark subterminal spots of the hindwing beneath. There are two other specimens recorded from the island, but they seem to have been lost. The late Mr. Geo. Masters, who had seen these specimens, always considered they were different from sempronius*”. There are no other subspecies involved.



Charaxes andrewsi Butler, 1900 was illustrated (Fig. 4) along with the original description. This Christmas Island species was described from specimens collected west of Flying Fish Cove in August and September; at and near Rocky Point, November and December, 1897 and Flying Fish Cove, April, 1898, which included one perfect female and a dozen more or less broken examples of both sexes. Butler noted “*As usual with the species of this genus, C. andrewsi has an extremely rapid flight and is difficult to catch*”. Braby, 2016 notes that a single specimen was collected from Roebourne Western Australia in 1899.

The naming of this species followed similar lines to *Charaxes sempronius sempronius*. Talbot, 1920 referred to it as *Eriboea pyrrhus andrewsi*; Stichel, 1939 as *Polyura pyrrhus andrewsi* and in 1982, Smiles accepted it as a species in its own right under *Polyura andrewsi*.



Subgenus *Charaxes*, *Latona* group: the subgenus *Charaxes* is the largest subgenus containing 119 species in 14 species groups. The *Latona* species group contains 4 species. One species applies to Australia.



Fig. 5

Charaxes latona latona Butler, 1865 was illustrated (Fig. 5) and described by Arthur Gardiner Butler in his paper, Monograph of the species of *Charaxes*, a genus of diurnal Lepidoptera.

Proceedings of the Zoological Society of London 1865, p622–639, the type location was given as Timor. Rothschild & Jordan, 1900 disputed this location, after examining several specimens from

Northern Moluccas, Halmahera, stating, in reference to Butler's specimen, “*The specimen was bought, according to the "Register," from Mr. Stevens, together with a number of other Lepidoptera, all said to be collected by Mr. Wallace on Timor. This collection contained several well-known North Moluccan forms which cannot be expected to occur as such on Timor*”. Rothschild & Jordan, 1900 went on to describe several subspecies including *Charaxes latona meridionalis* from Milne Bay, New Guinea, from a series of both sexes caught by Mr. A. S. Meek in December 1898, and in January, February, and March 1899.

In 1978 three specimens of a *Charaxes latona* were collected from Iron Range, Cape York north Queensland; two males were collected by Murdoch De Baar on 29th June and 7th July a third male was collected by D. Washbourne on the 3rd July. Their findings were published in an article by Johnson and de Baar, 1980 titled, First record of '*Charaxes latona*' Butler (Lepidoptera: Nymphalidae) from Australia, *The Australian Entomologist*, Volume 6 Issue 5 (Apr. 1980). The subspecific status was not established by Johnson and de Baar. The female was later illustrated by Johnson and Valentine, 1997 in their article titled, Further observations and records for butterflies (Lepidoptera) in northern Australia, *The Australian Entomologist*, Volume 24 Issue 4 (Dec 1997). Braby, 2000 noted “*The subspecific status of the Australian population has not been determined...it may be C. l. meridionalis....according to B. D'Abra*”. In his field guides of 2004, Braby simply referred to the taxon as *Charaxes latona*. Braby, 2010 while formally placing the Australian *Polyura* in *Charaxes* referred to it as *C. l. meridionalis* but noted “*The subspecific names provided in the revised checklist (Appendix) are based chiefly on geographic affinities of the taxa in question, and therefore should be regarded as provisional*”. In his revised field guide of 2016, Baby lists the subspecies, *C. l. meridionalis* without any qualification.

There are ten other subspecies involved *C. l. artemis* Rothschild & Jordan, 1900 from Sula Archipelago, Indonesia; *C. l. brennus* Felder, [1867] from Halmahera,



Indonesia; *C. l. ombiranus* Rothschild & Jordan, 1900 from Laiwui and Obi Island, Indonesia; *C. l. aruanus* Butler, 1872 from Aru Islands, Indonesia; *C. l. papuensis* Butler, 1869 from Aru Islands, Indonesia; *C. l. gigantea* Hagen, 1897 from Simbang (South Sulawesi, Indonesia); *C. l. marcia* Joicey & Noakes, 1915 from Biak, Indonesia; *C. l. leto* Rothschild & Jordan, 1898 from Goodenough Island, Papua New Guinea; *C. l. layardi* Butler, 1896 from New Britain and New Ireland, Papua New Guinea and *C. l. diana* Rothschild & Jordan, 1898 from New Hanover in the Bismarck Archipelago, Papua New Guinea.



Fig. 6

A further subspecies, not listed by Whalberg, is *C. l. stephanus*, raised by Rothschild & Jordan, 1900 from Stephansort and Erima, Papua New Guinea. It was illustrated (Fig. 6) in Seitz's *Die Groß-Schmetterlinge der Erde* Vol 9, 1927; I could find no reference to a change in its status.

I refer our readership to *Metamorphosis Australia* No 63, December 2011, in which Mark Hopkinson published an article titled, *Life history notes and observations of the Orange Emperor, Charaxes latona* Butler, 1865 [Lepidoptera: Nymphalidae].

The World Taxa:

The subgenus *Nichetes* contains one species group *Nichetes*, with one species, *Charaxes nichetes nichetes* Grose-Smith, 1883 from Nigeria, Cameroon, Gabon, Congo, Angola, Democratic Republic of Congo, Central African Republic and



Fig. 7

Uganda. It was illustrated (Fig. 7) by Grose-Smith & Kirby, 1890, in *Rhopalocera exotica*. There are five other subspecies involved; *C. n. bouchei* Plantrou, 1974 from Sierra Leone, Liberia, Ivory Coast, Ghana and Nigeria; *C. n. leoninus* Butler, 1895 from Democratic Republic of Congo, Tanzania, Malawi, Mozambique and Zimbabwe; *C. n. leopardinus* Plantrou, 1974 from Guinea, Ivory Coast, Nigeria, Cameroon and Chad; *C. n. pantherinus* Rousseau-Decelle, 1934 from Democratic Republic of Congo, Tanzania and



Zambia and *C. n. ssese* Turlin & Lequeux, 2002 from Uganda.

The subgenus *Polyura* contains 41 species in 5 species groups.

Pleione group contains 2 species.

Charaxes pleione pleione (Godart, 1824) was illustrated by Doubleday, 1849 (Fig. 8) in his *Genera of Diurnal Lepidoptera* under the synonym *Philognoma lichas*. The

type location is unknown, the type species was a female and part of the original description reads, “*We suspect that she lives in the West Indies*” which is completely wrong as it is known from, Ghana, Guinea, Ivory Coast, Liberia, Nigeria and Sierra Leone. The larva feed on *Senegalia pennata* and *S. brevispica* (Fabaceae). There are four other subspecies involved; *C. p. bebra* Rothschild, 1900 (Figs 9 & 10), [in the

Guyomar collection simply as *C. Pleione*, best fits this subspecies] it is found in the Democratic Republic of Congo, Kenya, Tanzania and Uganda; *C. p. congoensis* Plantrou, 1989 from Angola, Cameroon, Central African Republic, Congo, Democratic Republic of the Congo, Gabon and Nigeria; *C. p. delvauxi* Turlin, 1987 from Rwanda and *C. p. oriens* Plantrou, 1989 from Kenya and eastern Tanzania.

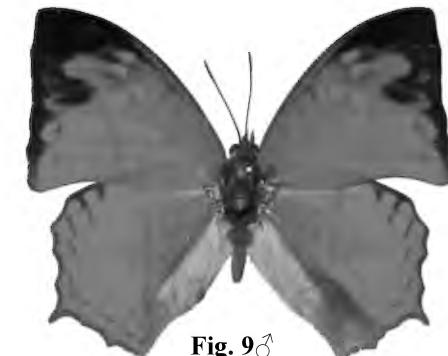


Fig. 8

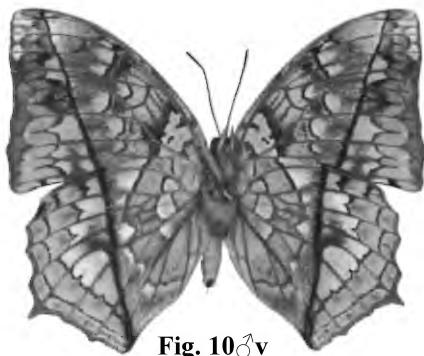


Fig. 9♂

Charaxes paphianus paphianus Ward, 1871 was illustrated (Fig. 11) by Rothschild & Jordan, 1899 in *Novitates Zoologicae* Vol 6. The type species location is Cameroon, it





Fig. 11

is also known from Angola, Central African Republic, Congo, Democratic Republic of Congo, Gabon and Nigeria. The larva feed on *Senegalia brevispica* (Fabaceae). There are two other subspecies involved; *C. p. falcata* (Butler, 1872) from Cameroon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, Sierra Leone and Togo and *C. p. subpallida* Joicey & Talbot, 1925 (Figs 12 & 13)

from Democratic Republic of Congo, Kenya, Sudan and Uganda.



Fig. 12♂



Fig. 13♂v

Zoolina group contains 5 species

Charaxes zoolina zoolina (Westwood, [1850]); members of the Zoolina group are, the only *Charaxes* to have wet and dry seasons forms; the males have one long tail,



Fig. 14♀

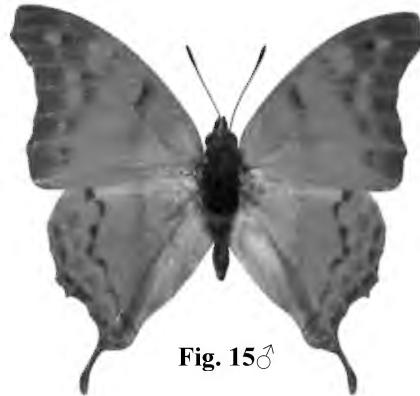


Fig. 15♂



the females have two. The type location was given as “Amazoulu, Port Natal” now Durban in South Africa. A wet season form ♀ was illustrated (Fig. 14) along with the original description. The dry season form ♂ (Fig. 15) is from the Guyomar collection. It is also found in Botswana, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Somalia, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. The larva feed on *Entada*, *Senegalia* and *Vachellia* species (Fabaceae). There are three other subspecies involved; *C. z. betsimisaraka* Lucas, 1872 [(Figs 16 & 17) a wet season form ♂ from the Pickering collection] from, Madagascar; *C. z. ehmckei* Homeyer & Dewitz, 1882 from, Angola and *C. z. mafugensis* Jackson, 1956 from, Burundi, Democratic Republic of Congo, Rwanda, Tanzania and Uganda.

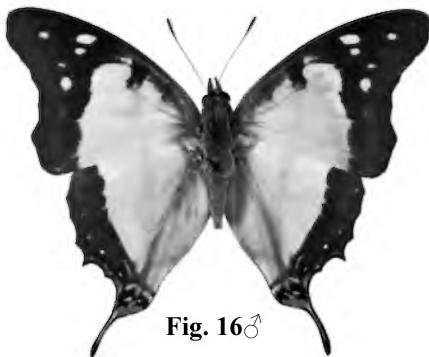


Fig. 16♂



Fig. 17♂v

Charaxes kahldeni Von Homeyer & Dewitz, 1882; (Figs 18 & 19♂) the male and female were illustrated (Fig. 20) along with the original description. The type location is Pungo Andongo, Angola it is also found in Cameroon, Central African Republic, Congo, Democratic Republic of Congo, Gabon, Sudan and Uganda. I could find no data on larval food plants.



Fig. 18♂



Fig. 19♂v





Fig. 20

The other members of the Zoolina group are, *Charaxes betsismisaraka* Lucas, 1872, *Charaxes ehmckeai* Homeyer & Dewitz, 1882 and *Charaxes mafugensis* Jackson, 1956.

Athamas group contains 12 species. The “athamas group is notoriously difficult to work with because most species share a rather similar appearance and lack morphological synapomorphies⁶⁵”, Toussaintet, et al, 2016.



Fig. 21



Fig. 22

Charaxes athamas athamas (Drury, 1773) [(Fig. 21) Pickering collection from Taiwan; (Fig. 22) Moss collection from Malaysia] was illustrated (Fig. 23) along with the original description, the type location was given as China. It has also been recorded from Sir Lanka, India, Bangladesh, Myanmar, Taiwan, Vietnam, Thailand, Malaysia and Singapore. The larvae feed on *Falcataria moluccana*, *Senegalia* species, *Albizia* species, *Caesalpinea* species, *Adenanthera pavonica*, *Leucaena leucocephala*, *Archidendron clypearia* (Fabaceae) and *Grewia* (Malvaceae). There are ten other subspecies involved; *C. a. andamanicus* (Fruhstorfer, 1906) from Andaman Island, India;





Fig. 23

C. a. madeus (Rothschild, 1899) from Sri Lanka; *C. a. faliscus* (Fruhstorfer, 1913) from Borneo; *C. a. kannegieteri* (Lathy, 1913) from Nias Island, Indonesia; *C. a. stratioculus* (Fruhstorfer, 1913) from Lombok Island, Indonesia; *C. a. sumbaensis* Swinhoe,

1897 from Sumba Island, Indonesia; *C. a. menaius* (Fruhstorfer, 1913) from Sumbawa Island, Indonesia; *C. a. palawanicus* (Rothschild, 1899) from Palawan Island, Philippines; *C. a. acutus* (Rothschild, 1899) from the Philippine Islands of Mindanao, Mindoro, Luzon, Bohol and Sarangani and *C. a. fruhstorferi* Röber, 1895 from Java.

A further specimen (Fig. 24), unnamed in the Guyomar collection, labelled from



Fig. 24

Malaysia, may also be an example of *C. a. athamas*, though it differs from the Pickering and Moss examples. It does not fit the newly named *C. paulettae* Toussaint, 2015 but has some resemblance with the newly raised *C. attalus*. Though *C. attalus* is not recorded from Malaysia it is on the adjoining Sunda Islands. I would prefer to leave it as unresolved.

The other species in the Athamas group are, *Charaxes schreiber* (Godart, 1824), *Charaxes luzonicus* (Rothschild, 1899), *Charaxes jalysus* Felder & Felder, 1867, *Charaxes moori* Distant, 1883, *Charaxes agrarius* Swinhoe, 1887, *Charaxes alphius* Staudinger, 1886, *Charaxes paulettae* Toussaint, 2015, *Charaxes attalus* Felder & Felder, 1867, *Charaxes bharata* Felder & Felder, 1867, *Charaxes arja* Felder & Felder, 1867 and *Charaxes hebe* Butler, 1866.



Eudamippus group contains 7 species:

Charaxes eudamippus eudamippus Doubleday, 1843 was illustrated (Fig. 25) along with the original description. The type location was given as Silhet [sic] Sylhet, Bangladesh it also occurs in India. The larvae feed on *Rhamnella franguloides* (Rhamnaceae), *Celtis boninensis* (Cannabaceae) and *Albizia* species (Fabaceae). There are nine other subspecies involved; *C. e. nigrobasalis* Lathy, 1898 from Vietnam, Cambodia, Thailand and Myanmar; *C. e. jamblichus*

(Fruhstofer, 1914) from Myanmar; *C. e. cupidinius* (Fruhstofer, 1914) from China; *C. e. rothschildi* Leech, 1893 from China; *C. e. whiteheadi* (Crowley, 1900) from Hainan an Island belonging to China in the South China Sea; *C. e. kuangtungensis* (Mell, 1923) from China; ***C. e. formosanus*** (Rothschild, 1899) [(Figs 26 & 27) in the Pickering collection simply as, *Charaxes eudamippus*, fits this subspecies] from Taiwan; *C. e. peninsularis* (Pendlebury, 1933) from West Malaysia and *C. e. splendens* (Tytler, 1940) from Myanmar

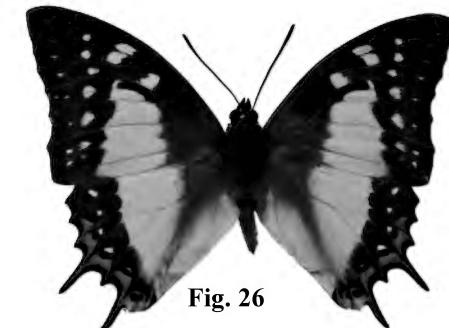


Fig. 26

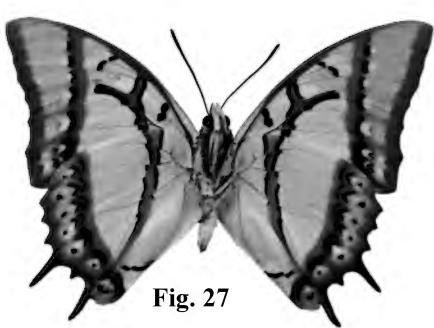


Fig. 27

Charaxes delphis delphis Doubleday, 1843 illustrated (Fig 28) along with the original description, the type location was given as "Silhet" [sic] (Sylhet, Bangladesh), it occurs from India to Myanmar, Thailand, Laos and Vietnam. I could find nothing of its food plants. There are at least four other subspecies involved; *C. d. concha* Vollenhoeven, 1861(Figs 29 & 30) from Thailand, Malaysia, Singapore, Borneo and Sumatra;

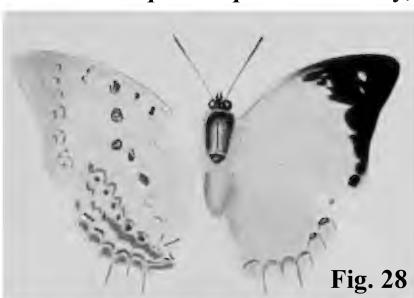


Fig. 28



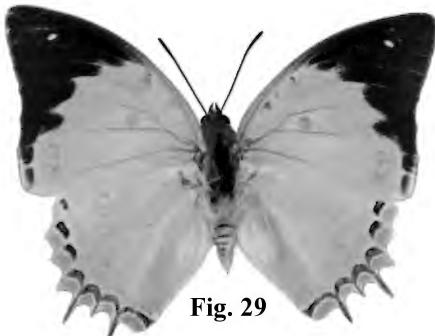


Fig. 29

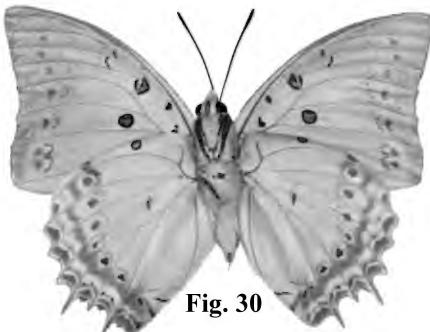


Fig. 30

C. d. cygnus (Rothschild, 1899) from Java; *C. d. niveus* (Rothschild, 1899) from Palawan Island, Philippines and *C. d. othonis* (Fruhstorfer, 1904) from Nias Island, Indonesia. Whalberg's Checklists also includes, *C. d. delphinion* (Fruhstorfer, 1904) from Borneo, Smiles, 1982 under the genus *Polyura*, in the *Bulletin of the British Museum* (Natural History) Vol 44 p.191, has *C. d. delphinion* as a synonym of *C. d. concha*. Y. Inayoshi, on his website, A Check list of Butterflies in Indo-China, follows Smiles.

Charaxes narcaeus narcaeus (Hewitson, 1854) was illustrated (Fig. 31) along with the original description. The type location was given as Chekiang, now Zhejiang a province of China. The larvae feed on *Trema orientalis*, *Celtis tetrandra* (Cannabaceae), *Archidendron lucidum* and *Prunus phaeosticta* (Rosaceae).

There are five other subspecies involved; *C. n. menedemus* Oberthür, 1891 also from China; *C. n. meghaduta* (Fruhstorfer, 1908) [(Figs 32 & 33) in the Pickering collection simply as *Charaxes narcaeus* belongs to this subspecies], occurs in Taiwan; *C. n. aborica* (Evans, 1924) from India; *C. n. thawgawa* (Tytler, 1940) from Myanmar; *C. n. lissainei* (Tytler, 1914) [(Fig. 34) from the original description], occurs in N.E. India.

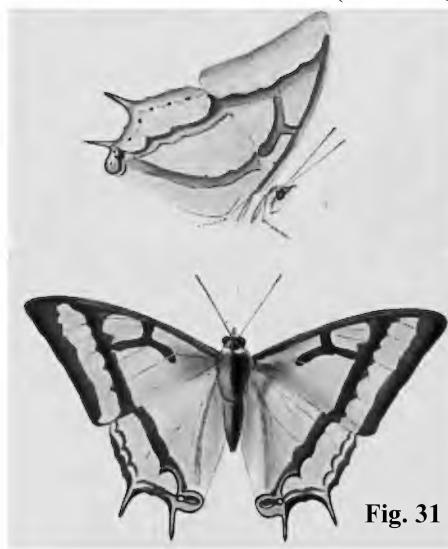


Fig. 31

To be continued in Magazine #96 March 2020



Life history notes on the Large Yellow Grass-dart, *Taractrocera anisomorpha* (Lower, 1911) Lepidoptera: Hesperiidae – Wesley Jenkinson



The Large Yellow Grass-dart is endemic to Australia and has been located sporadically across the northern half of the continent including the dry interior (Braby 2000). It has been recorded as far south as Tweed Heads in northern New South Wales (Dunn & Dunn 1991, in Braby 2000).

A more recent updated range-fill map has included a broader distribution in the Northern Territory, northern Western Australia and coastal eastern Queensland

regions in Braby 2016. I have collected a male specimen at Tyrone Station approximately 65km NNW of Charleville in south-western Queensland in October 2015.

This species is generally uncommon in its general distribution. Sometimes it may be locally common at some sites. It is chiefly located in eucalypt open forest and open woodland with a grassy understorey where the host grasses are established.

Adults can easily be confused with other *Taractrocera* and *Ocybadistes* grass-dart species. Within these genera, *O. hypomeloma* is very similar in size and appearance, but has a distinctive white margin along the dorsum of the underside of the hindwing. *Taractrocera* species can also generally be separated from *Ocybadistes* species by having a club shaped antenna with a less pointed apiculus [see images below]. Adults are similar in size and appearance to *T. ina* and some worn specimens can be very difficult to separate. The yellow markings on the upperside of *T. anisomorpha* are generally more suffused than in *T. ina* and the two orange spots at veins M1 and M3 on the forewing are generally joined to form a ‘continual’ orange subterminal band. These spots may join the three subapical spots which are usually more separated in *T. ina* [see female images below]. It is larger in size than *T. dolon* which usually has an



Left to right *Taractrocera anisomorpha* antenna
Ocybadistes walkeri antenna

Left to right
T.anisomorpha female
T.ina female



orange median spot on the upperside of the hindwing between veins Rs and M1 (see Braby 2000). In general grass-darts can be difficult to identify. Unless photos clearly show features such as those above, it is preferable to retain voucher specimens for accurate identification when recording species lists.

Males can be separated from females by having a very inconspicuous line of narrow sex brands located chiefly in the median section on the upperside of the forewing. Wing termens of the females are slightly more rounded and the upperside orange markings of some specimens may be slightly reduced giving them a darker appearance.

Individual specimens of *T. anisomorpha* show slight variation in the size and suffusion of the yellowish orange markings on the upperside.



Adult flight is typically very rapid and while basking they settle in a 'skipper' pose with their wings open [forewings half open, hindwings fully open] facing towards the sun, revealing the upper side markings [see photo adjacent of basking female]. Males typically hilltop along ridges and can be observed strongly defending open glades, chasing off other males and usually returning to the same perching spot on grass stems but occasionally settling on low vegetation or

sandy gravel. The females also frequent the same areas looking for suitable ovipositing sites. Both sexes can also be seen in the sloping grassy gullies below these ridges feeding on small native and exotic flowers (feeding similarly observed by Andrew Atkins in Braby 2000). Whilst feeding the wings may be open or closed. During cloudy conditions they settle on grasses with their wings closed.

Wingspans for the pictured adult specimens are: males 25mm and females 25mm.



Taractrocera anisomorpha (Large Yellow Grass-dart)

Images left to right: male, female, male underside, female underside

A female collected in November 2018 from a private property near Hillview south of Beaudesert in South-east Queensland laid several eggs in captivity. The eggs were laid singly on several grass species supplied. These eggs were successfully raised through to full size adults in captivity on a mix of available soft shade grown grasses,



chiefly Green Couch (*Cynodon dactylon*), and the exotic grasses: Johnson Grass (*Sorghum halepense*) and *Paspalum dilatatum*. Similarly, as with *T. dolon* the small larvae had a preference for *C. dactylon* but larger instars also fed on a mix of the three species offered. Green Panic (*Megathyrsus maximus*) was also offered but larvae rarely chewed this species.

During an earlier visit to this property a female was observed ovipositing a single egg curling the abdomen below a grass leaf blade in a tangle of grasses. The host grass was undetermined. Further observation at this site is required to confirm the natural host species in this region, as it still appears to be unknown.

Several host grasses have been listed by Atkins in Braby 2000. These include *Eulalia aurea* (listed as *E. fulva*) in the Alice Springs area, *Setaria paspalidiooides* from Isla Gorge and larvae have been raised on a *Chloris* species. A female has also been raised on an exotic grass, *Sorghum bicolor*, from the Darwin region by T.L. Fenner (Braby 2000).

The biology of this species was originally described and fully illustrated in monochrome by Andrew Atkins [see in references].



Laid eggs were approximately 1.0mm wide x 0.8mm high, smooth, dome shaped and white in colour. It was noted that *T. anisomorpha* and *T. ina* eggs remained uniform in colour throughout their duration, unlike *T. dolon* which, after 2 days, formed a pinkish red apex with broken lateral markings.

Freshly laid egg

Three first instar larvae emerged before 7.00am and soon consumed all of their eggshells. The larvae on *C. dactylon* created shelters towards the apex of the leaves by stitching silk threads across a leaf and tensioning the silk to roll the leaf edges in towards the centre. The open-ended shelters were then later lined with silk and were slightly longer than the length of the larva. When resting in the shelters the heads were facing upwards. The early instar larvae consumed small sections from the outer edge of the leaf, towards the apex of the leaf and also below the shelter. Larvae fed chiefly at dusk, but in captivity were also observed feeding during daylight. Larvae were very sluggish when disturbed and when moving to feed. In contrast *T. dolon* larvae being raised at the same time were more active when disturbed. Each larva created several shelters as they grew in size, stitching several leaves together (similarly observed by Atkins as in Braby 2000). They completed five instars and attained a length of up to approximately 26 mm. The larger larvae constructed two types of shelters, either a 'straight leaf' or a 'twisted leaf' style as pictured. Before pupation occurred, the entrances were sealed with silk.

Pupae, measuring 14mm in length, were located in closed silk-lined final shelters. Interestingly, of the several pupae examined, the cremaster did not appear to be attached to the shelter with silk and lacked the surface white waxy powder often associated with Hesperiidae pupae.



1st instar larva2nd instar larva3rd instar larva4th instar larva5th instar larva5th instar head capsule

Final instar shelter 'twisted leaf' type shelter (entry at the RH side)



Final instar shelter 'straight leaf' type shelter (entry at the RH side, sealed)



Pupa lateral view resting in shelter



Pupa dorsal view

Two batches were raised; batch 1 first adult to emerge had an egg duration of 6 days, larval duration of 34 days while pupal duration was 5 days.



Batch 2 was raised approximately two weeks later with first adult to emerge having an egg duration of 6 days, larval duration of 31 days while pupal duration was 11 days, with the final adult emerging 6 days later.

Locally, within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of adults from early October until March. The emergence of this species possibly relies on significant rainfall, particularly in spring after the winter dry season. It is possible adults may also be on the wing earlier in spring and later in autumn in this region depending on local rainfall and weather conditions. Based on current observations, there are most likely two generations per year in the Scenic Rim region.

Acknowledgements: I would again like to thank John Moss for his suggestions on the manuscript.



Photos Wesley Jenkinson

References:

Atkins, A.F., 1991. Observations on the biology of *Taractrocera anisomorpha* (Lower) Hesperiidae: Hesperiinae). *Australian Entomological Magazine* **18** (3): 121-123, figs 1-3.

Braby, M.F., 2000. *Butterflies of Australia – Their Identification, Biology and Distribution*. vol 1. CSIRO Publishing, Melbourne.

Braby, M.F., 2016. *The complete field guide to Butterflies of Australia – Second edition*. CSIRO Publishing, Locked Bag 10, Clayton South, Vic.

Rearing Caterpillars – Don Herbison-Evans

Because so few caterpillars of Australian Lepidoptera are known, often the only way to identify the species of a caterpillar is to care for it and rear it to an adult butterfly or moth. This is because most of the naming and classification taxonomy of Australian butterflies and moths was done over 100 years ago on specimens caught in Australia but taken to the British Museum in London, where the entomologists had no idea of the life histories of their specimens. For example: in the Lepidoptera webpages of the Coffs Harbour Butterfly House (<http://lepidoptera.butterflyhouse.com.au>), with webpages and adult photos of more than 5,000 species, less than 1,000 have caterpillar pictures.

For people wishing to rear a caterpillar that they have found, in order to identify its species, the caterpillar needs to be taken into protective custody, in order to keep ants, spiders, wasps, and other parasitic and predatory beasts from attacking it.



This is necessary because if nature is in balance, then every pair of adults will produce only 2 viable adults in the next generation. So if a female lays say 1,000 eggs, of which perhaps 500 hatch successfully into caterpillars, then on average 498 will die before reaching maturity. So the chances of your caterpillar surviving in the wild are very much slimmer than if you rear it carefully in captivity, protecting it from predators, etc. Thus it is a good idea to carry a little plastic bottle whenever you go out, for taking any caterpillars that you find into protective custody.

In order to capture a caterpillar maybe put a leaf in front of it, and then gently tickle the rear of the caterpillar with something to encourage it to walk forward onto the leaf, then you can put the leaf with the caterpillar on it into the container. It is wise never to touch a caterpillar as the hairs on many species break easily and can cause skin irritation or even stinging.



A caterpillar of *Hippotion scrofa*, Sphingidae in protective custody - Photo Bec Watkins



Wasps love caterpillars
Photo Trevor Jinks

A suitable simple container for rearing most caterpillars is a clean glass bottle, with a piece of fabric over the top held in place by an elastic band. In the bottle, it is a good idea to place some dry soil with some dead leaves, and a diagonal stick with algae and/or lichen on it. The soil and dead leaves are for caterpillars that pupate in the ground litter or under the soil. The diagonal stick is for the emerging adult insect to hang on to while it expands its wings.

The next consideration is whether to feed it. Many caterpillar species hide in the foliage of their foodplant while they are feeding and growing, but go walk-about when they are mature and need to pupate.

If a caterpillar is found walking about rather than on its foodplant, it probably does not need any more food.

There are two exceptions to this. If you notice a totally defoliated nearby plant, bush, or tree, then, in this case, it may be seeking more sustenance. Or if was found on an old fence or wall, it may feed not on leaves, but on algae and lichens. So choosing a diagonal stick with algae and/or lichen on it may solve this possibility.



If the caterpillar is immature and needs food, the easy choice of what to feed it is leaves of the plant species it was found on. Most caterpillars are fussy eaters. They can tell from the smell, taste and, texture, whether a leaf is good for them to eat or not. Most caterpillars will just refuse to eat anything that they think is poisonous to them.

Over the last 100 million years there has been an escalating war between plants and caterpillars. Various plants have evolved into over 100 different plant families, each producing different poisons to stop caterpillars from eating them. Meanwhile the caterpillars have evolved into over 100 different families, many of which have developed metabolisms, each equipped to cope with the poison typically from one plant family. So incidentally, if you can find the name and family of the caterpillar's foodplant, then that will help identify the caterpillar.

The five basic common Australian caterpillar foods are:

- * gum leaves,
- * wattle leaves,
- * herbaceous plant leaves,
- * grass, and
- * lichen

If an unknown caterpillar rejects all five, then rose petals and thinly sliced apple are good standbys. Apparently, plants in Rosaceae have developed very few poisons.

Many caterpillars are fussy about their humidity - some like dry conditions, some wet. The soil also helps control this. Many caterpillars get quite thirsty. If your animal looks a bit dry, try dipping new food leaves in water before giving them to the caterpillar. Too much water, then mould attacks the caterpillar. Too little, the caterpillar can die of dehydration. Every species has a different balance point.

If your caterpillar does feed, then change the food and remove the droppings every 2 days to stop mould taking over and attacking the caterpillar. If the caterpillar stops feeding, it may just be about to moult, sloughing the old tight skin, and changing into the next instar. Keep changing the foodplant leaves – however it may be about to pupate.

In due course, with any luck, the caterpillar will pupate. Many species do so in a silk cocoon. Pupation is usually signalled by its ceasing to feed. It may form a cocoon on the side of the container, or under the covering, or in a curled leaf of the food plant, or on a twig, or under the soil. It is best not to disturb the animal while this is happening. In pupating, excess fluid is expelled. The dry soil in the container is good to absorb that away from the pupa.

When pupation is complete (maybe several days), gently (the pupae bruise easily) take out any loose droppings and excess food plant which would otherwise go mouldy.



You then have to wait. Some adults emerge in 2 weeks, some in 2 years, so this may require some patience. The time depends on the species, the season, the weather, how much food it ate, and just how it feels.

Rearing caterpillars is a skill, and one learns by trial and error. Do not get upset if you do not succeed the first time. Your patience may go unrewarded. As mentioned above, a high proportion of caterpillars get infected with parasitoids (parasites that kill their host). These are usually fly or wasp species that lay their eggs on or in the caterpillar, before you found it. When these hatch, the fly or wasp grub eats the caterpillar from the inside. This tends to make the caterpillar upset and wander about instead of hiding on its food plant, and so these are the caterpillars that are often found. If a bunch of flies or wasps come out of the pupa, do not be too surprised. These flies and wasps are actually very important. If that is what you get, it would be good to contact Erinn Fagan-Jeffries at the University of Adelaide, who is studying these interactions.



Cocoons of parasitic wasps from a *Brunia replana* caterpillar, *Arctiinae* - Photo Don Herbison-Evans

You may consider saving them and donating them to your local museum together with information about the caterpillar, especially if you were able to photograph your caterpillar. The information on the various species of wasp or fly that parasitise each species of caterpillar is very important ecological information.

If you succeed in rearing an adult moth or butterfly, make sure it does not beat itself to a frenzy. Butterflies and moths basically do not like being kept in jars. A spell in the refrigerator at five degrees Celsius (not freezing which kills them) is a good way of putting them to sleep. Then you may finally be able to photograph it and identify it from pictures on the web or in books, or with the help of your local museum.

Extract from **The Mistletoes of Sub-tropical Queensland, New South Wales and Victoria** by John T. Moss and Ross Kendall

Rosewood Mistletoe

Amyema plicatula

Description

This bushy mistletoe grows as a stem parasite, but unlike most other *Amyema* species, has epicortical (external) runners.

The large distinctive leaves are elliptical to circular (2.5 to 8 cm long and 2 to 8 cm wide) with a rounded apex, thick base and obscure venation. The leaf petiole is thick and 5 mm to 10 mm long. Leaves are arranged opposite or occur as whorls of three or four.



Pink flowers are borne directly on main branches often at old leaf nodes with a peduncle and up to 8 (usually 4 to 7) rays each having a triad of sessile flowers. Fruit are pink, barrel shaped to 12 mm with a persistent central style.

Habitat and Host Plants

This mistletoe is extremely rare and threatened, being known from two isolated locations. The first is in remnant degraded rainforest near Lismore, New South Wales where Rosewood (*Dysoxylum fraserianum*) is the only recorded host. The second disjunct record is from montane tropical rainforest at Mt Lewis in north Queensland where Atherton Oak (*Athertonia diversifolia*) is the host.

Butterflies and Moths

None are known to use this mistletoe as a host.

Notes

This species is sometimes considered a subspecies of the widespread, lowland rainforest, New Guinea and Western Pacific species *Amyema scandens*.



Amyema plicatula (darker foliage) on *Dysoxylum fraserianum* (paler green foliage) Photo John Moss



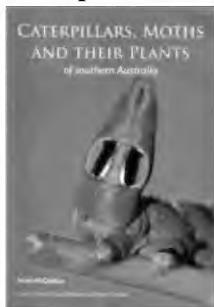
Amyema plicatula flowers (Hugh Nicholson)



Amyema plicatula fruit (Hugh Nicholson)



Caterpillars, moths, and their plants of Southern Australia



by Peter B. McQuillan, Jan A. Forrest, David Keane, & Roger Grund. Published by Butterfly Conservation South Australia Inc., Adelaide, 2019, 196 pages of text and photos, plus 9-page introduction and colour illustrations on the covers and flyleaf – Reviewed by *Don Herbison-Evans*

It is wonderful to see the publication again of a book looking not just at the beauty of adult moths, but at their intriguing life histories, foodplants, and behaviours. The main value of this book is perhaps to our children whose imagination may be stirred by finding a caterpillar and wishing to know more about it. But adults find caterpillars too, and they too may be frustrated by the concentration by Victorian Taxonomists on the adult forms, and be curious to know more about their find. This is the book for them too.

This compact (165x240 mm.) but lavish paperback includes
 175 colour photographs of Australian caterpillars,
 314 colour habitus photographs of Australian moths,
 96 colour photographs of their various foodplants,
 51 tinted Australian caterpillar drawings, each exemplifying one of the families and subfamilies,
 9 photographs of prominent entomologists,
 5 colour photographs of the authors,
 and many additional colour photographs of eggs, larval shelters, pupae, and cocoons.

The Preface includes

- * a foreword by the late David Leane,
- * four pages of acknowledgements, with attributions to 106 photographers and organisations,
- * an introduction to Lepidoptera and previous relevant publications,
- * a guide to the layout of the book,
- * five general pages about the importance, life history, structure, foodplants, survival strategies, seasonality, collection, and conservation of moths,
- * a history of "Moths and People" in South Australia,
- * and more about foodplants.

The main part of the book is 139 pages classified into sections, each covering one of 47 families and subfamilies, presented in the normal order of developmental sophistication: starting with Hepialidae, and ending with Agaristinae. Each page typically has one larger colour photo (~95x50 mm.) and several smaller colour photos (45x30 mm.), and is devoted to one common primary species, with mentions and often photographs of related species.



The book ends with lists separately for

- * further reading,
- * a glossary of entomological terms,
- * an index of caterpillar foodplants,
- * an index of moth common names,
- * an index of moth scientific names,
- * a set of biographies of the authors.

The book is clearly the product of the love of its subjects by the authors. Just searching out the photographs and getting permissions for each one from over a hundred photographers boggles the mind.

If Australia's unique entomological heritage is to survive for the joy of future generations, then we must start taking more care of the full ecological web in which these moths are involved. This book is a major step in that direction.

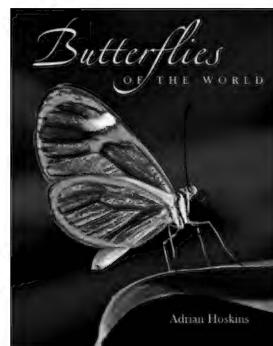
This book is available from BOIC at a cost of \$30 for members – \$35 for non-members (both plus postage)

Butterflies of the World by Adrian Hoskins – Reviewed by David Exton

Renowned lepidopterist, Dr Adrian Hoskins who has spent the last 35 years studying and photographing butterflies from all over the world has produced a superb book, which captures his brilliance with the camera underpinned by his rigorous scientific text.

Over 350 superb colour photographs are featured in the book, taken from locations around the world.

This beautifully illustrated book is in four parts namely, origin and evolution, lepidopteron biology, taxonomy and lastly habitat/conservation. Opening chapters cover the evolution, anatomy, lifecycle, natural enemies, migration/dispersal and ecology. The taxonomic section provides a comprehensive look at all the butterfly families and is illustrated by key examples from around the world. Australian butterflies figure prominently in this section.



Many books on butterflies solely concentrate on photography with little scientific information; in *Butterflies of the World*, Hoskins provides a scientific introduction to butterflies that will be of interest to both laypersons and science professionals. Very rarely these days does one find a coffee table book with scientific appeal.

An arrangement with the publisher, John Hopkins University Press, USA, has enabled our Club to sell this handsome 312 page book, which has a hardcover and dust wrapper for a member's price of \$70 and a non-member price of \$80 (both plus postage).



One small place on earth.....discovering biodiversity where you are – by Peter Kuttner – Reviewed by Peter Hendry



Since 1998 a year after his arrival at Mt. Tamborine from London, Peter Kuttner has been videoing and photographing the rich diversity of flora and fauna on Tamborine Mountain. While he has deposited many digital records in the Queensland Museum, Peter has longed for a more tactile record of his efforts and to this end presents us with this stunning 285mm X 225mm hard covered, landscaped formatted, 182 paged book – the

last three pages being species lists. In an effort to make it more readable to the general public, Peter has not captioned his images with names unless he had a common name. As many species only have scientific names they will be found in the list at the end of the book.

The forward is by Darryl Jones, Professor of Ecology at the Griffith University. As pointed out in the Acknowledgements, the book is not a solo effort and Peter has drawn assistance from a wide variety of people both in the field and for identification of his many subjects.

By no means a scientific work, and as Peter is first to admit he is not an expert in any field of nature, this is truly just simply a representation of one man's observations, both day and night so to be all inclusive. Having come from an avant-garde artistic background, Peter's inquiring mind is reflected in one image of what he perceives to be a gum nut mysteriously embedded in bark. This reminds me of my own frailties in observation, when something does not look right, look harder. The "gum nut" is actually the spent pupa of a cup moth.

The vast array of subjects imaged includes; grasses, flower, vines, palms, lichens, fungus, butterflies, moths, crickets, cycads, beetles, stick insects, flies, dragon flies, bugs, spiders, slugs, snails, snakes, lizards, birds, koalas, wallabies, the possum on the front cover and many more subjects. Apart from the images there are some wonderful anecdotes, like the grey shrike-thrush that built its nest on a bedroom window ledge or one of those one-offs when Peter sent an image of a fungi to a mycologist who wrote, "If you ever see it again, let me know and I will try and get up there and collect some" and Peter points out "needless to say, I never have", or in modern colloquialism "Still Looking".

It does not matter how many times you look at the book, each time you open it up it is to find something new. As nature lovers many of us tend to focus on a few subjects, this is a book that opens the mind to what is out there and you do not have to travel far, just look in your own small place on earth.

The book is available from the author: peterkuttner@bigpond.com



YOU ASKED



On Mon, 23 Sep 2019 at 10:20, Denis Taylor wrote:

I was at Tinchi Tamba on Sunday and noticed this Mangrove flowering. Think it's *Aegiceras corniculatum*. Noticed black beetles on flowers, have you seen these before?

Would appreciate any feed-back.

John Moss replied: Yes agree, River Mangrove, *Aegiceras corniculatum*, but have no idea of the identity of the beetles. Maybe we could put the question to our readers of Metamorphosis Australia? BTW this mangrove is host to larvae of the White-banded Line-Blue (*Nacaduba kurava parma*) and I have often seen Mangrove Jewel butterflies feeding on its nectar in an estuary at Redland Bay.

REPORTS

Panel of Experts – Downfall Creek Bushland Centre – 10th August 2019 – Dawn Franzmann

After our planning meeting we conducted, for the first time, our event named “Panel of Experts”. We assembled a panel of BOIC members, experts in many and varied fields, to be available for club members or members of the public to bring along specimens to exhibit and/or have identified.

The club ventured into uncharted waters by conducting this event. We were pleasantly surprised to have a very good turnout of interested people, who braved the gusty winds. Needless to say, our displays and banners were constantly flying in the breeze. The Downfall Creek Bushland Centre supported this event and staffed the Centre and assisted us throughout the morning.

We were able to have our Club microscope available for those wanting a closer look at their exhibits. Club members displayed some of their personal collections, which added to our Club’s display material.



Our books and interesting items of craft were on display and sales of these netted us a profit in the vicinity of over \$400.00. Daphne Bowden donated craft items aimed at the younger market. They proved to be very popular.

Thank you to all BOIC members who helped in the preparation of this event and also helped on the day. An extensive advertising campaign was undertaken by a small group of members. A special thanks to Ian and Judy Ferrier who helped me distribute flyers to many schools on the north side of Brisbane. The North West News (Quest Newspapers) featured the event on the front page of the paper leading up to the Saturday.



Native Plants Queensland (NPQ) Flower Show – Mt Coot-tha Botanical Gardens – 7 and 8 September 2019 – *Dawn Franzmann*

BOIC enthusiastically accepted the invitation to once again participate in this annual and highly-respected event. The weather was perfect and this was reflected in the numbers attending.

Successful events such as this don't just happen. Congratulations to the dedicated team of volunteers from NPQ for providing stall holders an opportunity to display their wares and interact with the public.

BOIC certainly always gains from this exposure and the 2019 weekend proved to be no exception. We gained three new members, a couple of renewals and many enquiries and book sales.

As we are a not-for-profit organisation, we rely on displays such as this to promote our own publications and also those of many respected authors. An exciting addition to our sales table for this weekend was the "Butterflies of the World" by Adrian



Hoskins, published by the John Hopkins University Press. David Exton and Ross Kendall went to considerable effort in securing 10 copies for our Club. Currently in Australia, they are not commercially available. If you want to add this wonderful book to your library, hop on to our website, www.boic.org.au and order one of the few remaining copies.

This year we were lucky enough to receive a large donation of bare-rooted plants from Garry Sankowsky, a club member in North Qld. They were shipped south to Maurie Tucker in Cooroy. Ross Kendall and Bernie Franzmann drove to Cooroy and assisted Maurie to pot them out into tubes. Maurie nurtured them along and some

weeks later Ross and Bernie visited again and collected them in readiness for sale at the NPQ weekend. Many other club members grew plants and these combined with Garry's contribution came to well over 300. Our plant sales amounted to \$600.



Our merchandising display was enhanced this year by the addition of our new pull-up banner, and members wearing our club polo shirts and name badges. These additions combined with our vinyl banner led people to a vibrant and happy group of club members, willing to share and impart knowledge on many subjects. Sales for the weekend from our display/stall grossed in the vicinity of \$900.

This weekend also gave us an opportunity, once again, to advertise and display the Butterflies Australia Project and its associated App. Chris Sanderson's work is nearly completed and the official launch was held in Canberra on 24 October. This App is now available to be downloaded from the App store FREE, courtesy of the Federal Government. It has been the privilege of BOIC to help promote this App within the wider citizen science community. It is pleasing to know that there will be a permanent data base of Australian Butterflies.

It is so pleasing to listen to many different stories as they unfold. Sometimes, I am in wonder as to the achievements and knowledge of so many people in this scientific arena.

Once again, another successful BOIC event; now to look forward to whatever exciting occasions 2020 brings for BOIC.

Deagon Wetlands Excursion – Saturday 19th October – Report by Dawn Franzmann

Our long-awaited excursion through the Deagon Wetlands finally took place, led by Russel Denton. Russel is a dedicated BOIC member and also a keen and regular



volunteer who spreads himself across the Brisbane City Council's environmental centres: Boondall Wetlands Environment Centre, Downfall Creek Bushland Centre and Karawatha Forest Discovery Centre.

BOIC members attending were: Jenny Rhind, Liz Wilson, Jon Hartas, David Exton, Denis Taylor, Helen Schwencke, Bernie and Dawn Franzmann. Visitors joining our excursion were: Beth and Sylvie Dalton, Frank and Marilyn Box.

The morning was overcast and we ended up receiving some welcome rain towards the end of our walk. The rain didn't hamper our enthusiasm and we managed to fit in over two hours walking time and talking time.

Proceeding along the track, we encountered many and varied invertebrates. This environment is not conducive to having an abundance of butterflies. The track /road is well maintained by the Council. Ever apparent was the evidence that the area has suffered due to drought conditions. Eventually, we reached the Lagoon.

Some of the invertebrates that we encountered were: black house spiders, unknown aphid, different types of leaf eating beetles, different types of bugs, ladybirds, termites etc.

An enjoyable morning was had by all.



Teaching the young





All photos in the Reports by Dawn Franzmann

SEED BANK

There are small quantities of each of the following host plant seeds available. If you require any of them, please send a stamped, self-addressed envelope to Daphne Bowden, 24 Rickston Street, Manly West Qld. 4179 and list which seeds you want. Please keep in mind that for the Seed Bank to operate we need deposits as well as withdrawals.

Alternanthera denticulata

Aristolochia acuminata (Tagala)

Aristolochia macroura

Asclepias curassavica

Asystasia gangetica

Brachychiton populneus

Hygrophila angustifolia

Glycosmis trifoliata

Melicope elleryana

Pararistolochia praevenosa

Senna acclinis

Senna gaudichaudii

Sesbania cannabina

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Planning and General Meeting

What: Our quarterly planning meetings are informative and interesting and we welcome members to contribute to discussion. Immediately following our meeting Richard Bull will present a talk on the **Richmond Birdwing Butterfly (*Ornithoptera richmondia*): Life history, host vines and the RBCN recovery projects.**

When: Saturday, 15th February, 2020 commencing at 10.00am

Where: Karawatha Discovery Centre, 149 Acacia Road, Karawatha

RSVP: Dawn Franzmann, Secretary BOIC on 0419 786 369 or

secretaryboic@gmail.com



DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions, and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Peter Hendry who provided the cover painting
- Daphne Bowden who works on layout, production, and distribution
- John Moss, Peter Hendry and Ross Kendall for scientific referencing and proof-reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Annual membership fees are \$30.00 for individuals, schools, and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname.

Butterfly and Other Invertebrates Club Inc.
PO Box 2113
RUNCORN Q. 4113

Next Club event –Planning and General Meeting – 15th February, 2020 - See Club Programme for details

